# Observing lessons: A journey towards a professional development cycle

Alf Coles and Katherine Evans share their exploration of lesson observation as a professional development tool.

Lesson observation has a history within ATM. in MT265, David Fielker described a practice that was used in the early days of the ATM of demonstration lessons (see also *From the archive* in this issue). We offer here a story from one school which developed a way of using observations for their own professional development, around a focus on students mastering mathematical concepts.

The context of the work linked to the National Centre for Excellence in Teaching Mathematics (NCETM) professional development materials for teachers. The addition and subtraction elements of the primary resources are now complete and freely available at https://www.ncetm.org.uk/resources/50639. The school we focus on in this article was trialling the materials, having not been involved in their creation.

The materials aim to offer a detailed and conceptually coherent route through the mathematics curriculum. The documents offer a "spine" to guide teachers' work in mathematics and are perhaps unusual in:

- the detail of the conceptual breakdown of content.
- offering a new ordering of the curriculum.
- promoting new pedagogical strategies, linked to an emphasis on offering *all* learners access to the same content.
- offering a consistent use of key representations for mathematics throughout the primary years.

The materials aim to offer ways in to content that will be accessible to learners and that help build conceptual understanding. The materials are aimed at teachers and, vitally, work is needed to translate them into lessons. Our experience is that this work needs to be done collaboratively.

## Towards a model of professional development

The work we report on here took place in a primary school in Bath. The school implemented work on the spine materials using a professional development model that they developed of: co-planning, co-observation and reflection.

Co-planning would begin at a staff meeting, focused on particular spine "segments". Teachers would prepare a week's work and part-way through the week would co-observe each other. There were de-briefing sessions immediately afterwards. Some of these teaching sessions were also video-recorded. In a subsequent staff meeting, small clips from a lesson would be worked on by the staff, identifying teaching strategies. The model can be pictured as in Figure 1.

The cycle proved feasible for the school to implement in terms of cost and appeared to open up conversations for staff across the school, for example, to discuss and agree on common representations to use in their teaching of mathematics.

There were two elements of observing lessons, one live, followed by an immediate reflection meeting and one based on a video. We focus on these elements and offer some detail of what took place.

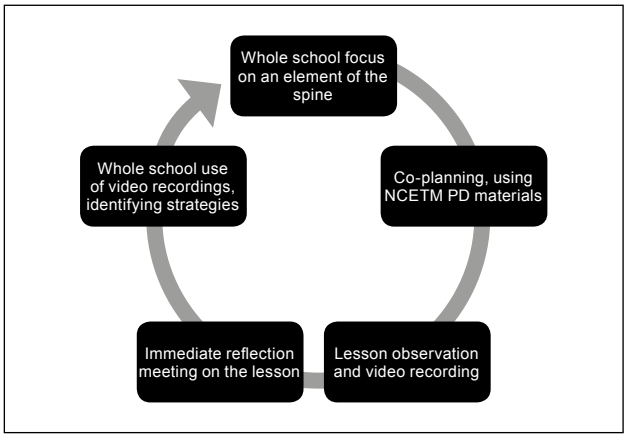


Figure 1: A cycle of professional development.

## Co-observing lessons

The foundation stage observed a year 1 lesson and vice versa, in November 2017. The year 1 lesson was based on segment 1.2 (see, https://www.ncetm.org.uk/resources/50719), "Introducing 'whole' and 'parts'". The de-briefing discussion that followed involved the teachers from the foundation stage, including Katherine, the year 1 teacher, Alf and the mathematics lead for the school. The following exchange is from field notes and is chosen to exemplify the focus of the initial discussion.

> Katherine (K): We looked at the spine together in the staff meeting and M [the year 1 teacher] chose what she wanted to focus on that would link in with her National Curriculum targets and objectives. Then we worked out what the concepts were that we would need to explore with the [younger] children to link into that, what the foundation was

that this was building on. Which was this idea of "part" and "whole" and actually understanding the concepts and the words themselves.

M: When you say to them, "What does the word whole mean to you?", S immediately said, "It's a dark place where animals live." So that's where they were coming from. They didn't really have the concept of any other sort of whole/hole at all. And as the week's gone on that has still been a little bit confusing for them, in that something could have a hole in it, and because it has a hole it can still be whole. But the misconception was that it's not whole because it has a hole … I showed … a circle and I was expecting then to say that's whole, but no, because it had the tiny little hole in the middle they were then thinking that's not complete.

K: I think that's a fundamental part of being able to understand what a whole group is, being able to take a number and think that is my whole. They need to be able to understand that whole concept, that different numbers can be a whole. That 12 can be a whole that you can split into 10 and 2, but then actually 10 could be a whole group. The more we talked about it the more we realised how complex it is.

J: Yeah, I mean a tiny part is missing, but it's whole because there's not a part that's missing, it's because that's how it was formed originally as it's whole. That's so conceptually difficult.

M: We were talking about shapes as well. I can have a square on a piece of paper and I can cut a line up the middle of it and say now I've got 2 rectangles, but if I cut a circle in half straight up the middle then that's a semi-circle, or half a circle, that still relates to the circle.

L: I think with our few days that we've been teaching we've found these really interesting misconceptions that have come up. So the size of a whole, one of the children was really set on the idea that a whole object had to be old.

This transcript is one instance of something that has recurred at different stages of the cycle, which is all of us coming to realise that mathematical concepts are more difficult and complex than they might seem. In the extract above there is a focus on a conceptual questions, "What is a whole?" and "What is a part?", that perhaps might have been glossed over in the past.

There is nothing in this conversation about evaluating the lessons or the teaching itself. We find this striking and surprising as there are many research studies that suggest that a focus on the mathematics is rarely present in de-briefing from lesson observations. Perhaps of relevance here is that the school had, in the previous academic year, implemented a programme of "Dragon Lessons", where up to six or seven staff would observe one lesson and de-brief afterwards, with the person teaching rotating throughout the year. In other words, there was some experience already present within the group, in relation to working with each other following a joint observation. Katherine's prompt, above, started the discussion and we see this as significant, in orienting discussion towards the concepts of "part" and "whole". We notice a sense of the teachers empathising with the complexity of the language, that something with a "hole" can still be a "whole", yet other times, taking a "hole" out of a "whole" means you are left with a "part", and at other times still we might switch to think of the part you have taken away as a new "whole". The immediate outcomes of such thinking are not in the realm of "tips for teachers" but more about a shifting orientation towards becoming curious about students' thinking and searching for the logic in viewpoints that we do not share.

## Working on video

After the first cycle of lesson observations and reflection meetings within the three teams, there was a meeting with all staff, where we worked on a video recording that had been taken of the year 5 lesson. Two lessons had been video recorded and Alf suggested a clip of three to four minutes that could be worked on, length based on principles of working with video (see Jaworski, 1990 and Coles, 2013). Alf chose a section of whole-class interaction. Alf began by getting participants to reconstruct what took place, without moving to evaluation or judgment. A key distinction that is required of people in the meeting is between an "observation" and a "judgment" (or "interpretation"). An example of a judgment could be, "At the start of the lesson the boys were disengaged", a judgment because it is not clear what criteria are being used for "disengagement", or indeed how we could ever tell this was the case. Turning this judgment into an observation might lead to a statement more like, "Four girls answered all the questions".

We offer, below, a shortened version of the discussion that took place. The transcripts are taken from field notes and have been edited to try to give a sense of the flow of the conversation. We intersperse the transcript with some commentary. The teacher on the clip is J.

Alf (A): Where did it begin? What happened first of all?

S: Two children were given tasks to do.

C: They were talking about different representations. I'm trying to remember if J used

the word representations.

A: So J begins with something about representations. What happens next?

K: If we're right about him asking how many representations, I think it was that, and then a child came up and did something, a bar model I think, and then said about the cherry, which he drew on a smaller board because there was no space.

H: But J listed some different kinds before that, I think J said column, addition, bar maybe.

A: So there was a listing of some methods?

K: I remember J saying "I don't think you've got space for a cherry model on the board so here's the smaller board with extra space".

A: So at some point J says there's not enough space on the board and there's a smaller board produced.

S: That's weird.

A: Did you not see that?

S: I saw two children at the front.

C: Did J say, "Does anyone have any other representations?" And D said, "Cherry", and then J invited him to come and show the cherry but there wasn't space on the board so he showed it on the little one.

H: That sounds about right. And then J also said, "In a minute, for these children I'm going to ask you to repeat this", or, "See what you think of it".

Up to this point, the group have been disciplined in focusing on the detail of events, sharing their sense of verbatim quotes from the video and also when they have disagreements about what took place. Alf's role was largely repeating. Discussion continued in a similar way. Alf is alert to bringing out potential differences in what was seen or heard, as a motivation to re-watch a section of the clip, perhaps after five to ten minutes with a focus on some specific questions. Following a re-watching of a section of the video, discussion continued much as above, with a focus on the detail of what was said and done. Alf then moved discussion on to a later part of the clip.

A: Anything more at the end? The kids were possibly writing. Sue was saying there was a bit where she thought they were very quiet at one point, looking.

R: Are they also interested in what the children on the table were doing. Was there some sort of observation going on with the children at the table?

A: I guess we can't tell what they're interested in, but we can say what they did or said.

Here, Alf reminded the group of the discipline of staying with the detail of observations, trying to avoid the interpretation. To support the focus on observation, the group re-watched the start of the clip again.

A: So you were seeing some interaction on the carpet. Let's go back and watch the beginning. It seems like we've got quite a few questions about the beginning and particularly what was J saying and what were the students saying? See if that helps.

M: I missed the first time that you'd said column, line, bar.

A: So where does that come? Where does J say that?

M: About twenty seconds in maybe.

K: Does J say, "What different representation", or, "What other representations do you have on your boards" and then L put his hand up and said, "Number line".

The sense, above, of teacher M commenting that they had missed something on first watching the video, when they came to re-watch it, is a familiar reflection from others using this discipline of trying to re-create a short clip of video. There is an immediate point here to reflect on as teachers, how on earth do we notice what is happening in real time in a classroom, when we can struggle on a video to know what was said on multiple re-watchings.

The second part of the way of working on video, having spent maybe 20 minutes on the re-construction phase, is to move to interpretation around an agreed focus. For this group, Alf prompted a focus on teaching strategies to support (their interpretation of) "mastery". We noticed a significant difference in how the teachers were now talking about the lesson.

H: Trying to use different representations for the same thing to support children who might learn in different ways, using different methods.

A: So giving children choice.

K: Using technical vocabulary, specific vocabulary.

M: Peer modelling.

H: A variety of representations. Some maybe appealing to visual representations rather than written.

A: How would you characterise those different representations?

H: Bar, written methods, column, line maybe more of a scaffold method.

Alf's role here seems to be one of sometimes naming

succinctly a strategy that has been described and sometime pushing for more detail.

> A: Other things that you saw happening in the classroom.
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> H: Were the two methods working with the same numbers? So they were in a way checking their own work, hoping that both methods would lead to the same answer.
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> A: So the focus isn't on the answer, in a sense they've got the answer. The focus is very much on methods. Anything else?
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> K: J was genuinely interested in what L was doing as well. I found it quite authentic, the response. It wasn't fake and I think that was why the children were so focused, they could see it was something special. It felt like something special in the room.
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> J: There is a point, I just realised watching the video, with some children near me by my feet. They were talking and I told them to be quiet, it's important and then I stare at L for a bit … I knew it was going to take him a while and be hard, so when he manages to muddle through it completely individually, there's something quite special happening. And when I realise he's going to get there completely on his own, that's when I turn my focus away from everybody else and put it all on him.
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> A: In that sense you're modelling a focus on him to the children. It's interesting when we focus on the questions that we ask as teachers, which are often "guess what's in my head", in a sense they don't feel like particularly interesting questions. But a focus on methods, not the answer, feels like you genuinely don't know what they're going to say and you're genuinely interested.

It is apparent that a range of strategies came out of discussion. These were not planned in advance and the agenda for the session was on teachers finding something of interest to them and articulating some practices they could try out, without an attachment to what those strategies were. There is an interesting parallel however, in the focus on concepts and children's thinking from the de-brief conversation and the sense in this final piece of transcript of a focus on teaching strategies that support a focus on students' thinking in the classroom.

## Reflections

We hope some of the power of the lesson observations that took place comes through in the transcripts above. As a profession, it seems we do not know much about the conditions under which reflective conversations lead to new insights. As we (the authors) reflect on the work that took place, we see evidence for the power of a focus on mathematical concepts. This focus is supported by the NCETM materials, which themselves are largely organised around conceptual development. We also see a power for making a distinction between observation and interpretation, when working with video, and being explicit when each one is required. We suspect there was something significant also in this process having been designed within the school. There was an outside provocation, with the NCETM materials, and Alf's presence, but the process was about the teachers and leadership in the school developing their practice without a pre-conceived notion of what this development would lead to. We see a parallel between the way teacher J, in the lesson, was genuinely interested in the thinking of his students and the way that the teachers in discussion seemed to be openly engaging in each others' thinking. For teacher J, a focus on "methods not answers" supported his attention to student L's thinking. In a direct parallel, in the use of video, Alf has an initial focus on "observations not judgments", without an agenda about the particular things teachers will notice. We conjecture that a "meta" focus of a teacher or facilitator supports participants in making their own sense and seeing the purpose of tasks as relevant to their own thinking.

Finally, we are convinced that the commitment of the headteacher was absolutely vital. The model came from the sustained interest from the head in getting teachers opening up their classrooms to each other and in learning from each other. It is with great sadness we report that Sue East, the headteacher at the time, passed away in December 2018. She was inspirational in her commitment to others and her belief in the creativity of students and staff alike. She is sorely missed.

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**Katherine Evans was working at St Andrew's Church School, Bath as an early years teacher at the time of this project, as well as working alongside Alf as a member of the research team. She now lectures in Early Childhood Studies at the University of Plymouth.**

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